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CryptoDefender - a fast way to encrypt your files

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ABSTRACT

1. Purpose of the research

Nowadays, many encryption software are available to computer user. However, very few people use them which result in many cases of information and data leakage due mainly over the Internet. Most people use USB Flash Drive to store and carry confident files back home to work on. When the USB Drive is lost, the files stored are often leaked. To prevent this type of incident occurring, “CryptoDefender” is developed to enhance files protection and to change user’s habit in handling confidential information.

2. Procedures

“CryptoDefender” is an add-in for common application software, e.g. Word, Excel, etc. It will appear as a new tab in the ribbon which provides the software an alternative for saving and opening a file. It protects the files in two ways: encryption and steganography. The data is first encrypted into cipher text as these encrypted data will be hidden in an image file to lower suspicion of readers. All of these procedures will be done by one click. For encrypt and decrypt, the user just needs to click the “Protect” and “Decrypt”. An extremely fast way to encrypt the file is “Quick Protect”. It will randomly choose an image from the image folder according to their file size. This function saves the time for choosing an image.

3. Data

The method for steganography is using last two bit of R, last three bit of G and B to store the encrypted data. In 24-bit bitmap, RGB is represented the color of each pixel and each of them is 8-bit. The leftmost bit of each byte contains the highest

value, and the right one contains the lowest value. Therefore, any change in the rightmost byte will only cause a minimal change in a byte value, and the color as well. 2-3-3 method is adopted to replace the pixels as encrypted data. It is used because it is in coordination with the program's fluency. 2-3-3 is obtained so that 1 pixel will contain 1 byte of encrypted data. For R, the last two bit will be replaced by encrypted data. For G and B, the last 3 bit will be replaced by encrypted data. If the Bitmap size is larger than the encrypted data, random data will be replaced into the remaining pixels.

4. Conclusion

“CryptoDefender” is user-friendly and efficient way to protect important and confidential digital files on most personal computers. This software will help to change the user's habit in securing their information as to avoid data leakage even when they are accidentally lost.

評語

1. 很有創意的專題。
2. Encryption 及 Watermarking 之技術有待進一步證實其效率及可靠性。